

ROAD SAFETY DESIGN AND HUMAN FACTOR INTERACTION

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Road safety depends on the integrated and complex relationship between various components: the driver's psychology, the traffic, the vehicle, the environment and the road infrastructure. The human element is certainly the most vulnerable, but also the most flexible, in any decision-making process. Road users try to drive in a safe way but the task is complex and the environment is not designed to prevent errors occurring. This research starts from a different perspective. We believe that in many cases the design of the road environment can be further adjusted to human capabilities. The central theme of this study is to estimate how design principles can reduce the probability of errors while driving. In order to study the driver-road interaction we assess the looking behavior using a mobile eye tracker.

Specifically, the ongoing studies in collaboration with Psychology Department of the University of Bologna focus on:

- (a) the role of vertical traffic signs in influencing driving and the study of new engineering solutions to make traffic signs more conspicuous;
- (b) the transition zones between rural and urban areas and the study of the most common safety measures such as "town gate", constituted by a restriction of the carriageway with appropriate vertical and horizontal signs;
- (c) the understanding of the risks associated with roadside advertising in its various guises so that informed guidelines for the regulation of such advertising can be formulated;
- (d) before-after analysis for road maintenance interventions to evaluate the impact on the users' safety, matching visual behavior and speed data;
- (e) user behavior analysis through the use of driving simulators in collaboration with IFSTTAR Paris.

The existing road design regulations are mainly related to motorized traffic and the main aim of this research is the integration of existing regulations and standards with "human behavior" findings for a safer infrastructure design. Car drivers, bike riders, unprotected users as cyclists and pedestrians are carried into the focus of concern.



Fig. 1. Mobile Eye-XG glasses for examination of human eye movement and pupil dynamics- installation.



Fig. 2. Mobile Eye-XG glasses for examination of human eye movement and pupil dynamics- output.



Fig. 3. Collaboration with IFSTTAR Paris for driving simulator studies.

MAIN PUBLICATIONS

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RESEARCH PROJECTS

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